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ABSTRACT

IN-ED is a monthly publication devoted to innovative educational ideas in higher education. In this issue, the facilities and equipment used in a completely self-paced life science laboratory at the University of Texas of the Permian Basin are described. Also discussed are the instructional methods used. (MH)

in-ed

A monthly publication of The University of Texas of the Permian Basin devoted to innovative educational ideas in higher education.

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In this special two month issue of ***in-ed****, Dr. Edwin B. Kurtz, Jr., a long-time proponent and utilizer of self-paced instruction, describes the facilities and equipment used in his completely self-paced laboratory as well as the present status of SPI on the University of Texas of the Permian Basin campus.*

Robert N. Rothstein, Editor

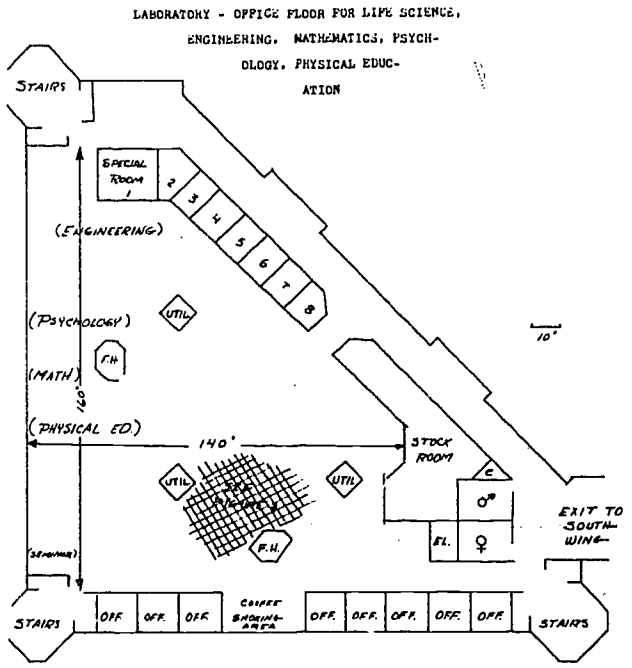
INDIVIDUALIZED INSTRUCTION AFTER THREE YEARS — AN INSTRUCTOR'S VIEWPOINT

Edwin B. Kurtz, Jr., Ph.D.
Professor and Chairman of Life Science Faculty

"UTPB — the University of Texas of the Permian Basin — is a new facility with new ideas, new methods and new meaning for *you* the student. UTPB offers some of the most exciting new concepts to be found in the United States." So stated one of the brochures for students and new faculty before UTPB opened its doors to students in 1973. One of these new and exciting methods was to be individualized instruction. And the new facility was to be large open areas for individualized instruction or self-paced instruction (SPI) as it came to be known. How has the method and how has the facility held up? Here is one instructor's view.

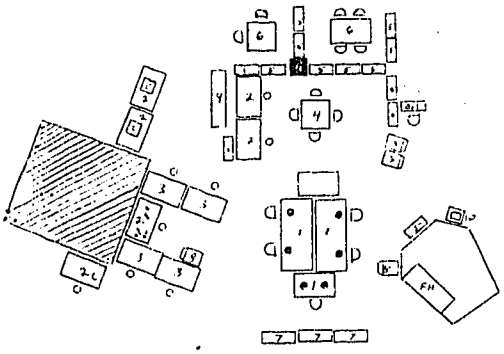
The open laboratory in which I work is a carpeted laboratory unlike any I have seen or worked in (Figure 1). It is a pleasant place to work and, as more is learned about how to use it, the opportunities for using the openness to accomplish my instructional goals continually increase. The open area is large — a triangular area averaging 150 feet along each side — it is

FIGURE 1



alive with varieties of activity, with life science, mathematics, engineering, psychology, physical education, and sometimes other disciplines conducting courses simultaneously within view of each other. Students move freely through the area and laboratory instruments and benches are ready for use any hour the building is open. Surprisingly, few things get lost or misused and even the carpeting has survived the minimum of spillage. Apparently students are willing to take care of *their* laboratory. Of course, areas have been set aside for study, relaxing. Groups of students often are seen studying together, then stopping to go to a laboratory area, then stopping to have some coffee or just enjoying themselves for a few minutes.

As shown in Figure 2, my life science courses take place in an area next to one of the utility boxes and a fume hood. Four wet labora-



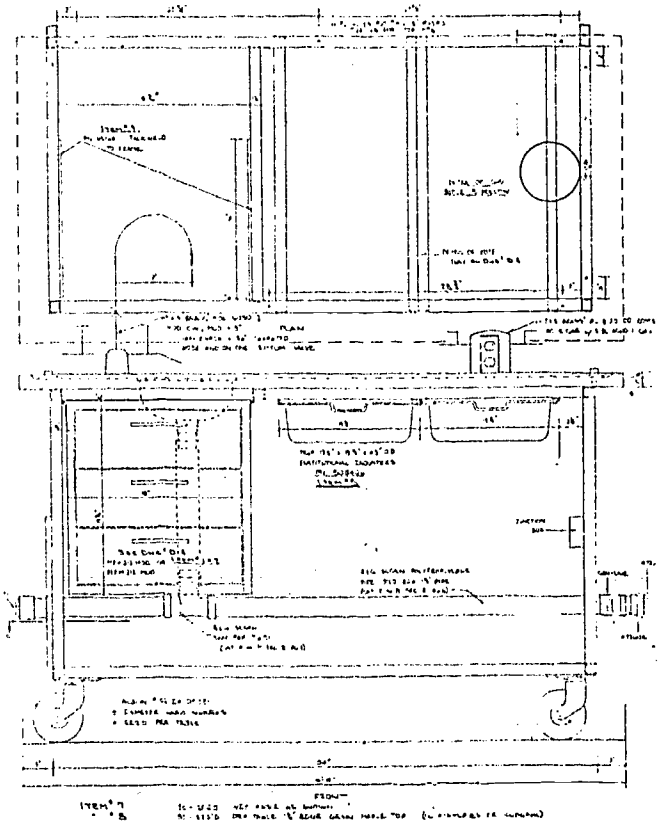
1. [illegible] tables - for general use
2. Dry lab benches - for general use and instruments such as centrifuge, ovens, pH meter, spectronic 20
3. Wet lab benches for general laboratory use
4. Proctor pod - for instructor and one to three students
5. Storage cabinets, shelves
6. Student study tables
7. Herbarium cabinets
8. Push cart with materials for instruction modules
9. Lighted growing table for plants
10. Sink

Figure 2. Portion of life science area for cell biology, plant morphology, plant taxonomy, and a variety of other courses and activities. All floor surface is carpeted and all equipment is open access

tory benches and six dry benches are deployed in the area for use by students at any time. Sometimes the equipment such as microscopes, centrifuge, pH meter, and so forth are used by students from other courses and even other disciplines. That is as it should be because, with my own students working independently and at just about any hour of the day, the equipment is "on call" at any hour and never locked up or unavailable. Equipment unique to other subjects in life science is deployed elsewhere in the laboratory, but my area provides maintainance and availability of equipment with which my students and I work most often.

Most of the faculty-student interaction in my courses takes place at the proctor pod, a fancy name for a small table and four comfortable chairs. Within an arm's reach of this table are references, student record files for each course, and other paraphernalia used in assisting my students to master the materials in the course modules, in testing competencies at the conclusion of each module, and in recording progress of each student in my self-paced courses. The environment is enriched with other materials, including crawly creatures such as spiders, fish in aquaria, growing plants, plant specimens for anyone to look at, and so forth. Wall charts, posters, and other colorful things add to the number of things to look at. Much remains to make the area look lived in, but there is usually something added every few days.

Some special words should be said about the mobile lab benches, both wet and dry. The benches (Figure 3) are on wheels and connect to



the water and power sources around the outside of the utility boxes. The wet benches are equipped with water and a sink and the top surface is a conventional chemically resistant material. The dry benches do not have water and the work surface is a hardwood top similar to a butcher's chopping block. Although the benches are on wheels and can be moved easily by one person, most benches remain in one location during a semester. Wet benches are not easily disconnected from the utility box, so they tend to remain in place during the year, but rearrangements do occur. Each bench is stocked with glassware and other special materials, but the items needed for my instructional modules are stored in trays on push carts which can be pushed next to the area at which a student has chosen to work.

The arrangement of my instructional area allows me to be close to students doing laboratory work while at the same time I can work with a student one-to-one at the proctor pod. Often tests over modules require laboratory work such as microscope work, and the close proximity of facilities allows this mixture of written and laboratory test items to take place with ease.

Each student's record of progress is available for him or her to examine at any time. These records, which are in a book case just behind the proctor pod, consist of a file folder for each student. Test outcomes are recorded on the front of the folder and tests, problem sheets, and other notes are kept inside the folder. Thus previous work by the student is available for study by both the student *and* me, which permits me to better diagnose progress and learning difficulties. About twenty hours of proctor time are scheduled for my various courses so that students who have morning, afternoon, or evenings available for work can interact with me.This interaction may consist of providing assistance with the modular and laboratory activities, problem solving, interpretation of written materials, or in providing assistance with prerequisite skills needed for the module the student is working on. In all of these interactions the open and self-paced environment is nearly ideal for applying educational techniques such as the use of wait-time in the verbal exchange, use of specimens and the laboratory for concrete examples, diagnosis of learning needs, use of reinforcement, and interpersonal techniques. The instructor-student interaction becomes a main means of conducting the course. Indeed, the modules and the instructional activities contained in them are only a part of the instruction, with much remaining to be learned at the time the student and instructor go over the materials or tests or whatever the student wishes to discuss. Although not all self-paced courses at UTPB are conducted with a large part of the instructional time devoted to this one-to-one interaction, the open laboratory provides an ideal environment in which to do this. The student-instructor relationship becomes very similar to the one enjoyed by most doctoral students and their dissertation directors; that is, a colleague to colleague atmosphere is established which is quite different from the usual lecture situation. I find student interaction time the most rewarding and enjoyable part of my instruction.

I have described the physical environment and the mode with which my self-paced courses operate. Let me now turn to some secondary aspects associated with self-paced instruction at UTPB. First, the student: Most of the students at UTPB are commuters, or they are married and have family responsibilities, or they work half-time or full-time while going to school, or various combinations of these. For these students the self-paced format and the open laboratory are ideal. But there is a paradox. The typical student with one or more of these extra-curricular responsibilites wants the most efficient way to "get the course completed." Efficiency usually does not mean self-paced instruction, because SPI requires a self-initiating student and little or no reliance on deadlines and instructor – determined study schedule. And so it is that the student who has completed one self-paced course and is now a "second generation" student is the one most likely to want and succeed in self-paced courses. If this student is a commuter, or parent, or worker, or all three, you will have a student who is convinced that more courses should be self-paced. Thus the flexible schedule and a system that permits working at your own pace around family and work obligations are ideally suited to the very

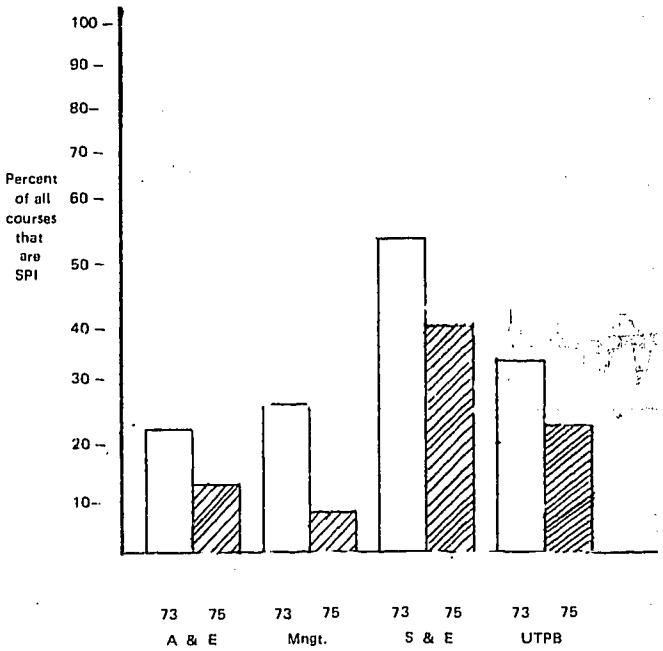
kind of student that UTPB has so many of. Yet that is just the problem, since as stated before these are the very students who wish to complete their courses with the greatest ease possible; for them self-paced instruction at first sight does not appear to offer this ease. There is much yet to be done to help new students to become aware of the benefits that self-paced instruction has to offer them and to help these students learn how to rely more on their own initiative and less on instructor-directed pacing and schedules.

A second problem, which relates to the one just discussed, concerns competition for the student's time between self-paced courses and conventional lecture/laboratory courses. As originally designed, the UTPB curriculum was to have between one-fourth and half of its courses in the SPI format. Each instructor was to teach at least one SPI course each semester. Thus the student would have the option of either or both SPI and lecture/laboratory courses. This variety is commendable, but the price for it is paid by the student who is caught between deadlines in conventional courses and the need to "get started" on that SPI course. In most cases, the conventional course wins and the student becomes a "procrastinator" in the SPI course and often does not complete the SPI course in one semester. Perhaps there is no harm in this, but because there is often only one faculty member with expertise in a particular subject area, the student may have to wait out a semester until the SPI course is taught again so that he can complete it.

The press of time has also taken its toll on the faculty commitment to new methods of instruction. As originally intended, each faculty was to teach about one SPI course each semester. In actuality, the percentage of SPI courses in some areas has dropped considerably since 1973-74, the first year of classes (Figure 4). The fate of SPI is more dramatically shown if one looks at the number of SPI courses taught each academic year by faculty at each rank:

SPI courses per faculty member at each rank per yr.

College	Year	Professor	Assoc. Prof.	Assist. Prof.
A and E	1973–74	1.2	1.6	0.9
	1975–76	0.4	0.9	1.4
Management	1973–74	1.7	0.9	0.7
	1975–76	0.3	0.7	0.5
S and E	1973–74	1.8	4.3	3.5
	1975–76	5.4	5.5	2.6
Total UTPB	1973–74	1.5	1.6	1.5
	1975–76	2.3	0.9	1.6



Percentage of courses that are SPI in each college and at UTPB in total, in the 1973-74 and 1975-76 academic years.

It is not altogether clear why SPI has not been accepted by more instructors, but certainly the time to prepare such courses and the student/faculty interaction time required of this type of instruction are important factors. Also, because our faculty is on the whole quite young at all ranks, the desire to be active in the usual professional roles may be taking precedence over new teaching procedures. The faculty is a group of dedicated and excellent teachers, but the time for innovative instruction can and does detract from other professional activities.

Summary

I have described what it is like to be an SPI instructor at UTPB and some aspects of the present status of SPI on this campus. There are many reasons for the successes and failures we have had with this form of innovative instruction. For the type of student that UTPB has, SPI offers much. And for this instructor working in the physical setting that was designed for such instruction, individualized instruction is providing the most rewarding — and exhausting — teaching he has had the pleasure to do over a quarter of a century of university life.

LETTERS. . .

(Dr. Michael Szabo answers some of the questions raised in the January issue in this timely letter; his letter is also particularly appropos to Dr. Kurtz's current article.)

Mr. Robert N. Rothstein, Editor
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Odessa, Texas 79762

Dear Mr. Rothstein:

I read with considerable interest your article on the Fixed Interval Phenomenon in Self-Paced Instruction (*In-Ed*, January 1976). This phenomenon has been observed at Penn State and elsewhere. The solution to the problem will not come from early conditioning of students in self-paced courses. This approach will be of little value until *all* instruction is self-paced. When this occurs, the problem will accelerate because students will use other criteria in deciding which courses to "put off" until later.

Our solution stems from Bloom's Mastery Model which suggests that most students can master most subjects given sufficient time *and* alternative instructional approaches. Self-pacing, when treated as an instructional end rather than a means to an end, focuses exclusively on the time component of the Mastery Model, and ignores alternative learning opportunities.

Our solution has removed the problem (except for one to two percent of students). First, assignments are mastery oriented or recyclable. Any assignment that doesn't meet specifications can be recycled by the student who times without grade reduction. Students value this option and are quick to capitalize upon it with the full realization that putting things off will cost them this option.

Second, each student completes a "date" contract in which he or she contracts to have the first version of each requirement turned in by a date specified by the student. This procedure permits the scheduling of requirement due dates

to avoid conflict with scheduled requirements and exams in other courses.

The system works quite well in an environment where 1) no courses taken concurrently are self-paced and 2) fewer than five percent of the students have ever had a self-paced undergraduate course.

I trust that this simple but workable solution is of use to instructors of self-paced courses.

Sincerely,

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